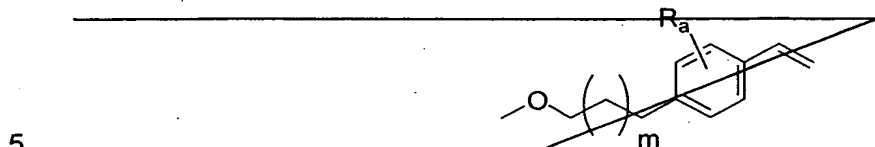


CLAIMS (as published):

1. A macromonomer of polyethylene glycol having repeat units in the range 6-300 and having at least one end terminated by an ether group having the formula:



where m is an integer of 0-10, a is an integer of 1-4, and

R is H or alkyl or aryl or arylalkyl;

~~or having the formula~~



where m is an integer of 1-10, and

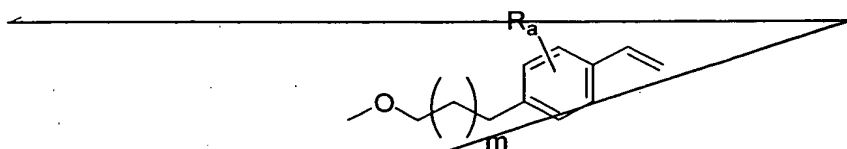
R is H or alkyl or aryl or arylalkyl.

2. A macromonomer having the structure:



where n is a real number of 6-300,

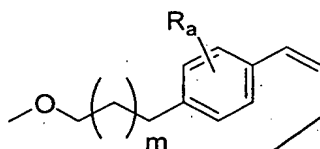
and where X and Y each independently is a group of the formula



where a is an integer of 1-4, m is an integer of 0-10, and R is H or

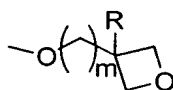
20 ~~alkyl or arylalkyl,~~

~~or where X is -OH, and Y is a group of the formula~~



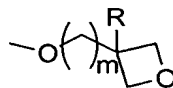
5 where a is an integer of 1-4, m is 0-10, a is as defined above, and R is H or alkyl or aryl or arylalkyl,

~~or where X and Y each independently are a group of the formula~~



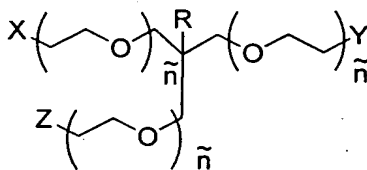
10 where m is an integer of 1-10, and R is H or alkyl or aryl or arylalkyl,

or where X is -OH, and Y is a group of the formula



15 where m is an integer of 1-10, and R is H or alkyl or aryl or arylalkyl.

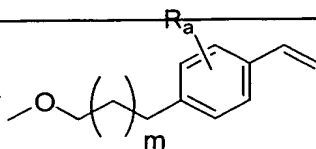
3. A macromonomer having the structure:



20 where R is H or alkyl or aryl or arylalkyl,

and  $\bar{n}$  is a real number of 6-300 as defined above

and where X, Y and Z each independently is OH or a group of the formula

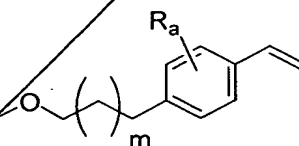


5

where a is an integer of 1-4, m is an integer of 0-10, a is as defined

above, and R is H or alkyl or aryl or arylalkyl,

provided that at least one of X, Y or Z is a group of the formula

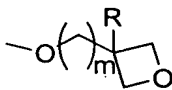


10

where a is an integer of 1-4, m is an integer of 0-10, a is as defined

above, and R is H or alkyl or aryl or arylalkyl,

~~or where X, Y and Z each independently is are OH or a group of the formula~~

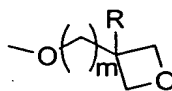


15

where m is an integer of 1-10, a is as defined above, and R is H or

alkyl or aryl or arylalkyl,

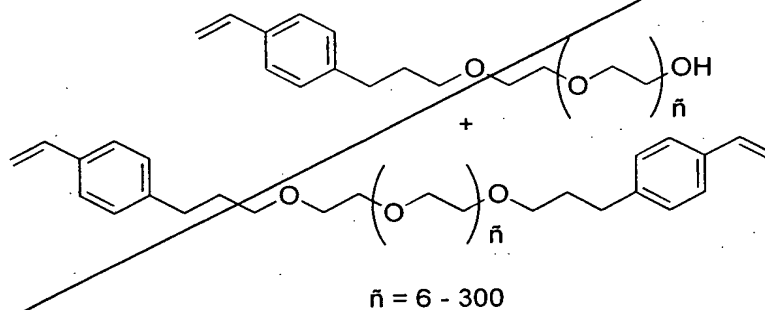
provided that at least one of X, Y or Z is a group of the formula



20

where  $m$  is an integer of 1-10,  $a$  is as defined above, and  $R$  is H or alkyl or aryl or arylalkyl.

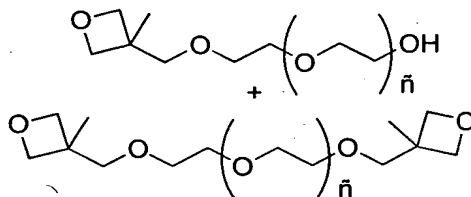
~~4. A macromonomer according to claim 2 which is terminated by a vinylphenylpropyl group and has the formula:~~



~~where  $R_a$  and  $m$  are as defined in claim 1.~~

10

4. ~~5.~~ A macromonomer according to claim 2 which is terminated by an 3-methyloxetan-3-ylmethyl ether group and has the formula:



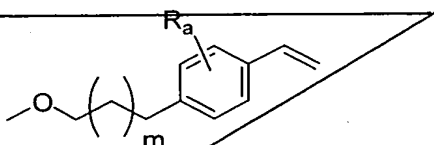
15

where  $\bar{n} = 6-300$

where  $R$  and  $m$  are as defined in claim 1.

5. ~~6.~~ A macromonomer according to claim ~~5~~<sup>4</sup>, which has been acetylated or in other ways temporarily hydroxyl-protected on free hydroxyl groups.

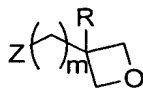
6. ~~7.~~ A process for the preparation of the macromonomers of claims 1 or 2 comprising  
 5 reacting an alkali metal derivative of a polyethylene glycol having 6-300 repeating units with a halo substituted compound having the formula:



where Z is Cl, Br, I, toluenesulfonyloxy or CF<sub>3</sub>SO<sub>3</sub>

10 and where a is an integer of 1-4, m is 0-10 and R is H or alkyl or aryl or arylalkyl

or having the formula



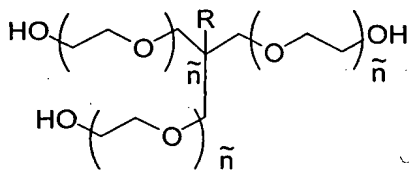
15

where Z is Cl, Br, I, toluenesulfonyloxy or CF<sub>3</sub>SO<sub>3</sub>

and where m is an integer of 1-10, and R is H or alkyl or aryl or arylalkyl

7. ~~8.~~ A process for the preparation of the macromonomer of claim 3 comprising reacting  
 20 an alkali metal derivative of a polyethylene glycol having the formula: -

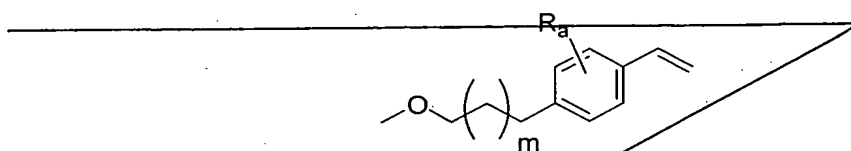
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where R is H or alkyl or aryl or arylalkyl and  $\tilde{n}$  is 6-300

with a halo substituted compound having the formula:

5



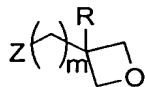
where Z is Cl, Br, I, toluenesulfonyloxy or  $\text{CF}_3\text{SO}_3$

and where a is an integer of 1-4, m is 0-10, and R is H or alkyl or aryl or

10

arylalkyl

or having the formula



where Z is Cl, Br, I, toluenesulfonyloxy or  $\text{CF}_3\text{SO}_3$

15

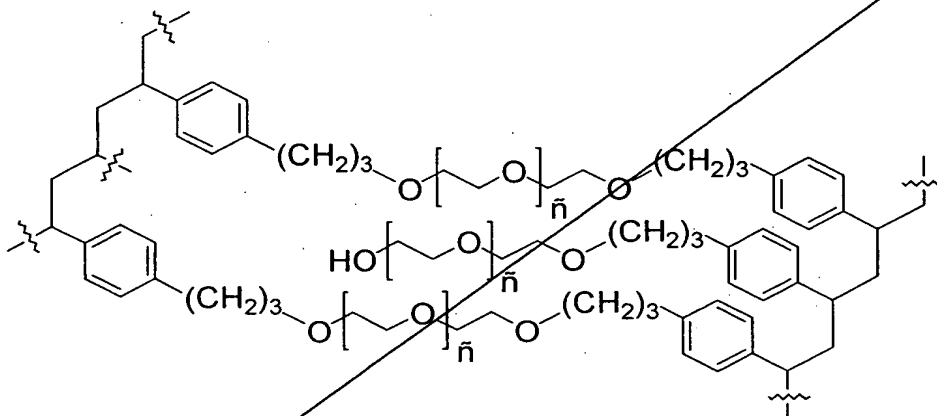
and where m is 1-10 and R is H or alkyl or aryl or arylalkyl

8. ~~8.~~ A process according to claims ~~6.~~ <sup>6.</sup> or ~~7.~~ <sup>7.</sup> wherein the alkali metal derivative is a sodium derivative.

20 ~~10.~~ <sup>9.</sup> A process according to claims ~~6.~~ <sup>6.</sup> or ~~7.~~ <sup>7.</sup> wherein the alkali metal derivative is a potassium derivative.

10. ~~11.~~ A cross linked polymer formed by the polymerisation of a macromonomer according to claim 2.

5 ~~12.~~ A cross linker polymer according to claim 11 wherein the macromonomer has the structure as claimed in claim 4, the polymerisation being initiated by a free radical catalyst and the polymer structure is represented as follows:



10

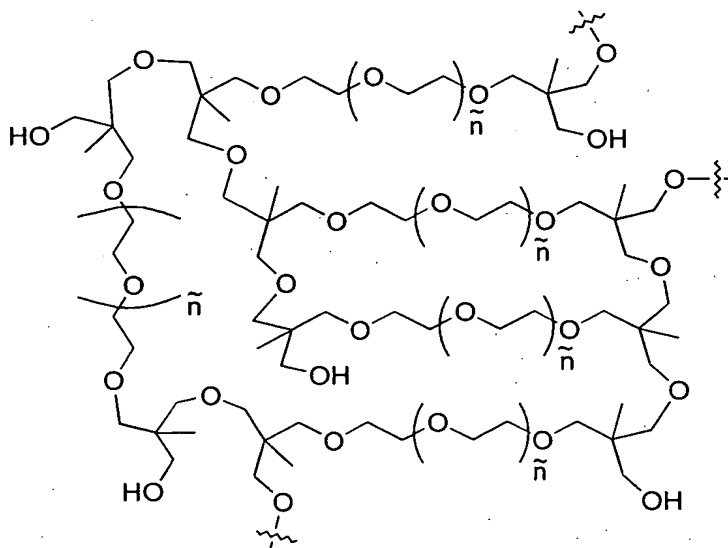
where  $\tilde{n} = 6-300$

~~where  $R_a$  and  $m$  are as defined in claim 1.~~

11.

10.

~~13.~~ A cross linked polymer according to claim ~~11~~ wherein the macromonomer has  
 15 the structure claimed in claim ~~5~~<sup>4</sup>, the polymerisation is initiated by a cationic catalyst and the structure of the polymer may be represented by the structure:



where  $\bar{n} = 6-300$

5

where R is as defined in claim 1.

12.

14. A crosslinked polymer according to claim <sup>10</sup>11 wherein the macromer used for its preparation has the structure of claim <sup>5</sup>8 and the per-O-acetylated or in other ways temporarily hydroxyl-protected polymer structure analog to the hydroxylated structure of claim <sup>11</sup>13 is obtained.

13.

15. A cross linked polymer formed by the bulk polymerisation of a macromonomer of claim 3.

15

~~16. A beaded crosslinked polymer according to claim 12 made by reverse suspension or spray polymerization~~

14.  
~~17~~. A beaded resin according to claim ~~13~~<sup>11</sup> or ~~14~~<sup>12</sup> formed by polymerization of droplets in silicon oil.

15.  
~~18~~. A beaded resin according to claim ~~13~~<sup>11</sup> or ~~14~~<sup>12</sup> formed by spray polymerization in a hot inert gas.

16.  
~~19~~. The use of polymers prepared according to claim ~~11~~<sup>10</sup> as supports for organic synthesis.

17.  
 10 ~~20~~. The use of polymers prepared according to claim ~~11~~<sup>10</sup> as supports for solid phase enzyme reactions.

18.  
~~21~~. The use of polymers prepared according to claim ~~11~~<sup>10</sup> as supports for synthesis of peptides, DNA, RNA and oligosaccharides.

15  
 19.  
~~22~~. The use of polymers prepared according to claim ~~11~~<sup>10</sup> as supports for peptide-, protein-, DNA- or RNA-ligation.

20.  
~~23~~. The use of polymers prepared according to claim ~~11~~<sup>10</sup> for chromatographic separations.

21  
~~24~~. The use of polymers prepared according to claim ~~11~~<sup>10</sup> for affinity purification.

22  
~~25~~. The use of polymers prepared according to claim ~~11~~<sup>10</sup> for protein immobilisation

23.

~~26~~<sup>17</sup>. The use of polymers according to claim ~~20~~<sup>17</sup> in which the enzyme interact with a substrate or an inhibitor linked to the support.

24.

~~27~~<sup>10</sup>. The use of polymers according to claim ~~11~~<sup>10</sup> in which the use involves release of a  
5 drug bound to the solid support.

25.

~~28~~<sup>24</sup>. Release of a drug according to claim ~~27~~<sup>24</sup> where the release is mediated by an enzyme.

26.

10 ~~29~~<sup>10</sup>. The use of polymers according to claim ~~11~~<sup>10</sup> for solid phase magic angle spinning NMR-spectroscopy.

27.

~~30~~<sup>10</sup>. The use of polymers according to claim ~~11~~<sup>10</sup> for combinatorial chemistry.

28.

15 ~~31~~<sup>10</sup>. A beaded polymer according to claim ~~11~~<sup>10</sup> formed by suspension polymerization in silicon oil.

29.

~~32~~<sup>28</sup>. A beaded polymer according to claim ~~31~~<sup>28</sup> where the beads are stabilized by a  
surfactant

20

30.

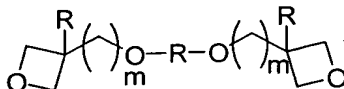
~~33~~<sup>29</sup>. A beaded polymer according to ~~32~~<sup>29</sup> where the surfactant is obtained by radical polymerization of a mixture of acryloylated PEG-OMe and acryloyl propyl pentamethyl  
disiloxane.

31.

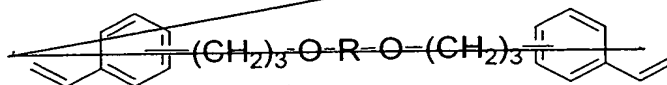
34. A polymer according to claim ~~11~~<sup>10</sup> with addition of a short temporary crosslinker which may at a later point in time be selectively cleaved to result in expansion of the resin.

32.

5 35. A polymer according to claim ~~34~~<sup>31</sup> where the short crosslinker has the structure



←or



10

<sup>w</sup>  
Where R is a alkyliden, aryliden, silane, siloxane thioether or ether bridge chemically susceptible to selective cleavage conditions.

33.

36. A macromonomer according to claim ~~1-6~~<sup>5</sup> prepared according to claim ~~7~~<sup>6</sup> or ~~8~~<sup>7</sup> but with the inversion of electrophile and nucleophile so that the tosylate or triflate or halide of PEG is prepared and reacted with the metal alkoxide of 3-methyl-oxetan-3-yl methanol or vinylphenylpropanol.

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